



IN THE US PATENT AND TRADEMARK OFFICE

Application No.: 09/829,548

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First Named Inventor: Junhai Liu

Application Title:

Examiner: Mr. Stephen J. Lechert, Jr. Art Unit: 1732

Mailed April 19, 2004

Commissioner of Patents and Trademarks

Washington, D.C. 20231

Sir:

In response to the Office Action Summary mailed 01/02/2004, we would like to cancel the original version of "abstract" and replace it with a new abstract, which is herein attached. As suggested, this abstract is now much shorter.

In addition, please allow us to offer further justifications or reasons for the patentability of those claims that were rejected or objected to due to the "double patenting" concerns.

In Item (4) of DETAILED ACTION, the Office indicated that "Claims 1-7, 9, 12-17 and 26 are rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1-7, 9, 11-16 and 25 of prior US Patent No. 6,376,148. This is a double patenting rejection." We are of the opinion that the two sets of claims differ fundamentally. The explanations are given as follows:

- (1) Claims 1-7, 9, 11-16 and 25 of prior US Patent No. 6,376,148 did not provide a method to obtain a 3-D object of multiple materials or multiple colors. Instead, it provided a method to build a 3-D object of single-color or uniform material composition throughout all layers.
- (2) Some of the features of Claim 1 of the subject application that are patently different and distinct from those of Claim 1 of prior Patent No. 6,376,148 are highlighted in the

following paragraph (using **boldface** and underline):

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1. A solid freeform fabrication method for fabricating a **multi-material** three-dimensional object from successive layers of a primary body-building powder material, **at least a modifier powder**, and a binder powder in accordance with a computer-aided design of the object, said design comprising geometry **and material composition data**, said method comprising:
- (a) providing a work surface;
 - (b) feeding a first layer of said primary body-building powder material to said work surface;
 - (c) operating an electrophotographic powder deposition means to create transferable images of said **at least a modifier powder and** said binder powder image in accordance with said design;
 - (d) transferring said transferable powder images to said first layer of primary body-building powder material;
 - (e) applying energy means to fuse said binder powder, forming a binder fluid to permeate through said first layer of primary body-building material for bonding and consolidating the powder particles in said first layer to form a first cross-section of said object;
 - (f) feeding a second layer of said primary body-building powder material onto said first layer and repeating the operating, transferring, and applying steps to form a second cross-section of said object;
 - (g) repeating the feeding, operating, transferring, and applying steps to build successive layers in a layer-wise fashion in accordance with said design for forming multiple layers of said object; and
 - (h) removing un-bonded powder particles in said multiple layers, causing said 3-D object to appear.

This claim clearly shows that the present method must use a computer-aided design that contains material composition data (e.g., the data serves to define different colors for different locations or different layers of a 3-D object), in addition to the data on the geometry of the 3-D object. By contrast, in our earlier US Pat. No. 6,376,148, only geometry data was needed.

In the present method, **at least a modifier powder** is used to achieve the variation in

material composition (or color) from point to point or from layer to layer. The present method therefore must "create transferable powder images of said at least a modifier powder and said binder powder image in accordance with said design." It may be noted that, in Claim 1 of the subject application, a modifier powder and binder powder may be combined or integrated in a single image or in two separate images. A modifier powder image may be created and transferred to the surface of a corresponding primary body-building material layer before a binder layer is transferred. Alternatively, a reverse sequence may be followed. The former is preferred, which is specifically emphasized in Claim 8 of the subject application (i.e., the modifier powder image is transferred prior to the binder powder image).

In contrast, Claim 1 of prior US Pat. No. 6,376,148 did not involve the creation and transfer of modifier powder images and did not have provisions for varying the material composition or color.

In conclusion, we humbly maintain that Claim 1 and its dependent claims 2-7, 9, 12-17 and 26 do not pose a "double patenting" concern since they are truly different and distinct from the corresponding claims in US Pat. No. 6,376,148.

We would greatly appreciate it if the Office could change its position and make all claims in question (Claims 1-17) allowable (in addition to claims 27-29, which are already allowed).

Respectfully yours,

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